

Means for Solving the Problem

- [0014] To achieve the object described above, according to one aspect of the present invention, a metal ion eluting unit includes: a plurality of electrodes; and a drive circuit that applies a voltage between the electrodes, and elutes metal ions from one of the electrodes serving as a positive electrode by applying the voltage between the electrodes. The metal ion eluting unit further includes a control circuit that controls the drive circuit so that the drive circuit periodically reverses the polarity of the voltage applied between the electrodes, and, in a period from one voltage polarity reversal to the next voltage polarity reversal, operates, from when the voltage applied between the electrodes is reversed until a predetermined period elapses, in a first current mode in which the value of a current flowing between the electrodes equals a first value and operates thereafter in a second current mode in which the value of the current flowing between the electrodes equals a second current value which is smaller than the first current value.
- [0015] According to such a configuration, setting the first current value at an optimum current value for preventing scale deposition and setting the second current value at a current value for providing an optimum elution efficiency of metal ions in accordance with water quality permits preventing the scale deposition at the initial period of voltage application after the polarity reversal of the voltage applied between the electrodes, and also permits preventing a current, which flows between the electrodes after the initial period of voltage application has passed after the polarity reversal of the voltage applied between the electrodes, from becoming too large. This stabilizes the metal ion elution after the initial period of voltage application has passed after the

polarity reversal of the voltage applied between the electrodes, and eliminates a problem of shorter electrode life and a problem of too high elution concentration of metal ions. Consequently, the metal ion elution can be performed efficiently and stably over a long period of time.

[0016] In the configuration described above, from the view point of avoiding the problem of shorter electrode life and the problem of too high elution concentration of metal ions, the first current value is larger than the second current value.

[0017] From the view point of avoiding the problem of shorter electrode life and the problem of too high elution concentration of metal ions, it is preferable that the period of the first current mode be shorter than the period of the second current mode.

[0018] It is preferable that the drive circuit perform constant-voltage driving during the period of the first current mode and constant-current driving during the period of the second current mode. Performing the constant-voltage driving by the driving circuit during the period of the first current mode permits the flow of a maximum current in accordance with water quality and interelectrode condition, thus improving the effect of scale deposition prevention.

[0019] It is preferable that the polarity of the voltage applied between the electrodes be periodically reversed with a voltage application rest time inserted during every reversal. According to such a configuration, the metal ions eluted from the electrode which serves as a positive electrode before the voltage application rest time can be separated from this electrode at a sufficient distance during the voltage application rest time. Thus, even when this electrode turns into a negative electrode after the voltage application rest time, the metal ions eluted before the voltage application rest time is not pulled back by this electrode. Consequently, this does not waste the power

consumed for the metal ion elution, and also avoids failure to provide a desired total